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PROGRAM PLANNING OF ASYNCHRONOUS ON-LINE COURSES *DESIGN COMPLEXITIES AND ETHICS*

Jay W. Gould III

The advent of the World Wide Web provided the feasibility of instant feedback between student and instructor analogous to the teaching methodology of ancient Greece. However, modern lecture halls or classrooms notably diminish the student's knowledge expectancy, suggesting a normal distribution curve. Research results affirm that learning is the sole responsibility of the student. However, unless the design team responsible for developing the distance education course addresses on-line variances and the instructors acknowledge their responsibility to provide motivation by putting a personal instructional touch into the "tube," the attainable two-sigma shift to the right will not be achieved. Therefore, has the Web's distance asynchronous on-line instruction defined a solution for the long-held dilemma of finding an educational methodology that will achieve results analogous to tutorial education and, if so, under what conditions would those similar results be achieved?

According to Joel Barker (1997), "When a paradigm shift occurs everyone is set back to zero." Digital age technology has affected every stakeholder in adult education and added some new players never before involved in the process. Software technologists, service technicians, on-line mentors, learning specialists, and possibly psychologists have been added as stakeholders, a group that already includes teachers, students, and institutional administrators.

During the 7th Hong Kong Web symposium, panel moderators Nigel J. French and W. F. Massy (2001) conducted an international virtual panel discussion, an interchange of ideas, on how to face the on-line educational challenges of the 21st century. The primary challenge was to provide access to a wider range of students from varying educational and ethnic backgrounds and afford them the opportunity to perform on an even playing field, while at the same time reducing student

costs. The conference featured a simulation game for program planners to compete on methods for handling the shrinking resident course and campus infrastructure needs while expanding campus Internet technology and security. A significant part of a program planner's design is to resolve issues pertaining to the technological net, servers, security, Web support, hosts, and operating systems (French & Massy, 2001).

Not everyone agrees that on-line distance learning is the freight train coming down the track. A February 2001 broadcast of the news show *60 Minutes* contrasted traditional universities such as

"Not everyone agrees that on-line distance learning is the freight train coming down the track."

Harvard, Yale, and Stanford with profit universities such as University of Phoenix, Jones University, and Capella University. Dr. Carole Fungaroli-Sargent, Georgetown University professor of English, gained her 15 minutes of

fame in her interview by proclaiming, "[Your education] is the same as sex on the Internet. You can get it on-line, but it's a lot better in person" (Hartman, 2001).

Although Fungaroli-Sargent's comments addressed growing concerns regarding on-line distance learning in a more humorous light, there are general beliefs that stem from fear that information technology (IT) usage for educational purposes will result in the loss or replacement of human contact. Subsequently, the increase in the use of adjunct professors and teaching assistants could result in the laying off of traditional faculty.

"This fear [is] expressed in a variety of ways [through] the American Federation

of Teacher's [1999] ad campaign about the 'Five Minute University,' the break-down-in-community argument; and the no-proof argument — 'no one has shown that technology can improve learning.' Since education is a human or social practice, and it has primarily been practiced in face-to-face settings, physical contact becomes the primary enabler of learning" (Twigg, 1999, p. 5). But do these thoughts support beliefs that asynchronous learning may be less effective?

For instance, the efficacy of asynchronous on-line education has been challenged. Research conducted at the University of Central Florida by Dr. Charles Dziuban and Patsy Moskal (2001) indicates there is no significant difference between face-to-face and on-line distance learning.

Kristin Hasselbrack presented a paper at the 2001 Interservice/Industrial Training, Simulation and Educational Conference suggesting that if an on-line course was facilitated in a manner defined in Benjamin S. Bloom's (1984) research, the average student could be moved a possible two sigma to the right of the mean (Hasselbrack, personal communication, December 3, 2001). Program planning for on-line courses is changing dramatically — precipitated by the impact of technology, a population of students growing asymptotically, teacher fear, and institutional resistance to change.

PARADIGM SHIFT IN EDUCATION

For centuries, teachers trained in the tutorial educational methods of Socrates and Plato had a significant emotional event when Gutenberg's textbooks expanded the

educational system. The oldest guild in Europe saw its educational precepts change from tutoring one-on-one to teaching groups of students in the classroom lecture halls. Learning shifted from being experiential — learning from the master, to the students learning from each other, to the sage on the stage — where much of the responsibility for student learning was placed upon the capability of the lecturer. Learning in this format required the presence of the student in the lecture hall. Great learning institutions, “ivy towers of intellect,” were built and worshipped as hallowed institutions.

Those who could not attend became part of the uneducated masses. Various attempts were made to broaden the field and provide access to a greater population of learners by utilizing media different than the human voice in the lecture hall or classroom. Some of these adventures were correspondence schools, radio lectures, television broadcasts, and closed-loop television hookups. Cassette tapes, videotapes, and CD ROMs added to the milieu, but nothing really provided that paradigm shift that would and could bring about worldwide education by expanding educational availability to large numbers of people distant from the subject matter experts.

To understand the impact on educational program planning, the series of events that gave life to on-line education must be examined. The inability of educational institutions to fulfill the needs of a worldwide student population remained in a static condition until a change of events occurred at the opposite end of the country. The paradigm shift in education would cause the ivy towers of intellect to crack and lose mortar where some are

predicting the walls will “come tumbling down” to the clarion call of the World Wide Web’s trumpet of asynchronous on-line learning. The Sloan Foundation’s philanthropic interest in funding family’s efforts to move up the economic scale and the technology of the digital age were melded together providing the structure for this dramatic change in educational instruction (Mayadas, 1997).

CAUSE AND EFFECT

Stanford University formed the backdrop for the creation of the World Wide Web. Tim Berners-Lee and Robert Cailiau, Conseil Européen pour la Recherche Nucleaire (CERN) engineers searching for a way to exchange information and data between nuclear scientists, documented in detail a “hypertext” project proposing a descriptive catch word, World Wide Web, complete with a uniform resource locator (URL), hypertext transfer protocol (HTTP), and hypertext markup language (HTML) standards with prototype Unix-based servers and browsers (Gromov, 1995). These events defined the invention of the Internet, the foundational base of asynchronous on-line education.

New enterprises require money. The details of the Sloan Foundation’s granting of seed money are defined in the Sheffield Lecture series. In January 2000, Dr. Ralph E. Gomory (2000), president of the Sloan Foundation gave the Sheffield Lecture at Yale entitled, “Internet Learning: Is

“Great learning institutions, “ivy towers of intellect,” were built and worshipped as hallowed institutions.”

It Real and What Does It Mean for Universities?” Gomory cited the lessons learned in the following statement:

While the Asynchronous Learning Network (ALN) is an attempt to reproduce the basic elements of classroom teaching, it is certainly not the same as classroom teaching. For those who teach ALN classes, teaching will be different....

“In on-line courses, the subject matter expert is part of a team comprised of an experienced on-line faculty program planner, Web technician, software programmer, editor, copyright expert, and an independent evaluator.”

We have learned that if homework is constructed to be instantly electronically corrected and returned it can be an important learning tool; we have also learned that inadequate training on the fundamentals of the underlying software can lead to the disappearance of a large portion of a class, before learning about the course material itself has even begun.... It is the pedagogy that counts....

Often the current providers are much slower to react, due to internal organizational and personal reasons, the fear of cannibalizing their own business, or various forms of denial.... By making learning outside the classroom heroic, we can make it what it ought to be, an ongoing part of ordinary life (Gomory, 2000).

The experience utilized for the citation of the lessons learned were based upon the experiences of Dr. Frank Mayadas (1997), hired by the Sloan Foundation after retiring from IBM in 1992. Dr. Mayadas became the program manager for the birth of asynchronous distance learning on the Internet, and the University of California at Berkeley received the first seed money to launch ALN in 1993.

Since then, over 100,000 students have enrolled for the ALN experience with more than 4,000 faculty-semester hours invested. Pennsylvania State University (PSU) was given seed money for its ALN adventure in 1994.

The Sloan Foundation was not alone in the philanthropic movement for greater access to education. The Pew Symposia sponsors “an on going national conversation about issues related to the intersection of learning and technology that places the discussion in the context of student learning and ways to achieve this learning cost effectively” (Twigg, 2001).

The Olin Foundation provided funding for Vanderbilt University to develop a program-planning guide for on-line courses. Drs. John Crocetti and John Borne, in conjunction with Dr. Eric McMaster of Wild Dog Technology LLC, presented their work at the Sloan-C6 International Conference on Asynchronous Learning Networks at the University of Maryland on November 3, 2000. Their work was presented as a pre-conference workshop, “Strategic Planning for On-line Courses.” The workshop cited an absolute requirement for immediate student electronic feedback and covered every aspect associated with program planning for an on-line course.

In resident lecture-hall courses, the subject matter expert is the professor delivering the lecture. In on-line courses, the subject matter expert is part of a team comprised of an experienced on-line faculty program planner, Web technician, software programmer, editor, copyright expert, and an independent evaluator. The conversion of the traditional 30-hour quarter, three-hour resident course requires 200 to 300 total team hours to obtain an asynchronous on-line

student-centered virtual learning community. In turn, the hours required for the initial development of a new course, not previously given, is estimated to be 480 hours of faculty time. However, by the second year the course is offered, other than the on-line mentor time, the course will require approximately 20 hours of faculty maintenance excluding other members of the team (Bourne, Campbell, & McMaster, 2000).

WEB-BASED ASYNCHRONOUS ON-LINE MOTIVATIONAL PROGRAM PLANNING

The literature, whether it is a published book, referred journal, seminar/symposium proceedings, or a published paper available through the Web or Educational Resources Information Center (ERIC), supports the consideration that on-line educational programs are significantly different from resident courses. Resultantly, the program planning techniques suggested for achieving satisfactory results are also significantly different than the time-honored models sometimes utilized by resident course authors. However, there is a significant caveat. Ivy towers of intellect have existed for over 650 years. In that time frame, there has been sufficient opportunity to perfect the program planning process.

From its birth in 1993 at Berkley, on-line asynchronous education is only eight or more years old at the most, a total infant by comparison. The pioneers of this new methodology of dispersing education to the population as a whole are brimming with different ideas as to the model that might be used to place the converted resident course or newly conceived

on-line course on the path to noteworthy success. The older models carried over from the resident course days, unfortunately, do not adequately address the significant number of nuances, idiosyncrasies, and changes in paradigms on-line education carries with it.

The field is populated with specialists examining different ways to enhance and better their own educational or technological niche. Some books are the result of an aggressive editor who collects published papers from many authors to present views on the changing education paradigm. One such text is *Web Based Instruction*, edited by Badrul H. Khan (1997). Chapter 11 by Richard Cornell and Barbara L. Martin (1997), "The Role of Motivation in Web-Based Instruction" states, "As many as 30–50 percent of all students who start

"The field is populated with specialists examining different ways to enhance and better their own educational or technological niche."

a distance education course drop out before finishing" (Moore & Kearsley, 1996, p. 93). To counter the high drop-out rate, they posit the Keller Motivational Design Model originally developed in 1983 and later adapted to Web-based courses in 1993 by Keller and Burkman as a method of continuous motivational reinforcement throughout. This responsibility is assigned to the course developer of the program plan. Key motivational principles and course design strategies for Web-based courses are "Variation and Curiosity, Relevance, Challenge Level, Positive Outcomes, Positive Impression, Readable Style, and Early Interest" (See Appendix for details; Keller & Burkman, 1993, pp. 96–98).

Student motivational program planning cannot be overstated. For a Web-based course to be successful, at any institution, the Keller and Burkman Motivational Design Model should be followed.

Cornell and Martin offer some sound thoughts for the instructor converting a course from residency lecture to an asynchronous on-line status:

"Student motivational program planning cannot be overstated."

1. Re-tooling establishes the wrong mind-set. The possibilities and constraints of teaching via the Web are quite different from those used in traditional classroom delivery. If the class is destined for Web delivery, consider

it an opportunity to rethink the entire class from beginning to end, addressing not only the methods to be employed but also the content.

2. Seek the opportunity to redesign the course well ahead of the time it is due to be taught. Teaching a Web-based course is not just a re-do of what has been taught in the past. Suggest to the department chair that using the Web will require the acquisition of a new set of teaching skills, including sufficient time to search for sources on the Web, locate those not on the Web, and integrate them into the course design.
3. Realize that using the Web to deliver instruction will, at least initially, take far more time, not less; that the time communicating with students will increase disproportionately as compared

with the time spent in the traditional classroom.

4. Use this new teaching assignment as a means to obtain a new computer to conduct class via the Web....
5. Identify who among the students is skilled in using the Web for other purposes and let them assist. Admit a learning deficit (related to technology) to the class as, together, we will all learn how to use this new method of instruction.
6. Find others who have been asked to teach via the Web. Join with them as they learn the techniques, or ask for their insights if they have prior Web-based teaching experience.
7. If the institution has asked you to teach via the Web, it is likely that the agency has a faculty development center or office of instructional resources. Within these facilities is a team of experts able to assist (Cornell & Martin, 1997, p. 99).

Colin McCormack and David Jones hold, "The greatest benefits of Web-based classrooms occur via a pedagogy that most effectively uses the characteristics of the technology to increase quality of the learning experience" (McCormack & Jones, 1998, p. 23). The responsibility for learning in Web-based courses shifts from the instructor to the learner. With the student motivational methodology suggested by Keller and Burkman and program planning team following the suggestions of Cornell and Martin, a course quality increase is assured as well as a motivated enrolled student.

STUDENT POPULATION SERVED

“There are at least three typical global higher education student profiles. One is Asian as its dominant trait; another is over 23 years of age; and the third holds an associate-equivalent or bachelor’s degree and either has been or is about to be ‘downsized’ from a job” (Jones, 1997, p. 4). The author goes on to remark, “We are coming to understand the concept of ‘life-long learning.’ Indeed, lifelong learning has moved from the category of ‘discretionary’ personal investment to ‘essential’ as people scramble to bolster their credentials in a volatile global market place” (Jones, 1997, p. 5).

Rena M. Palloff and Keith Pratt have observed, “Much of the research done on successful students in distance education programs suggests that students who are attracted to this form of education share certain characteristics, including that they voluntarily seek further education, are motivated, have higher expectations, and are more self-disciplined” (Palloff & Pratt, 2001, p. 109). Learners assuming control over their learning encourages independent thinking, it “is a combination of computer mediation, platform, and geographic and temporal independence” (McCormack & Jones, 1998, p. 22).

THE 2 SIGMA QUESTION

Since the advent of distance learning, research has been done to determine whether or not students were learning. Whether it was a correspondence course, radio broadcast, video, television broadcast or closed-loop activity, CD Rom, or E-learning, the answer to

this question for the most part has always been the same — no significant difference.

Thomas L. Russell has been tracking the “No Significance Phenomenon” from 1928. Russell lists a significant number of research studies where the phenomenon is true. Companion to this site is a lesser listing of research studies where there is a significant difference. The majority of these research studies found that on-line education is better than face-to-face. In a very few cases the opposite is true (Russell, 2002). The research effort is turned to how to develop an on-line educational system that achieves the coveted goal of a two sigma shift to the right.

Benjamin S. Bloom (1984) raised the two sigma question in his paper, “The Sigma Problem: The Search for Methods of Group Instruction as Effective as One-to-One Tutoring.” Bloom accomplished a critical analysis of completed dissertations of two students at the University of Chicago. The conditions of instruction were compared — conventional, mastery learning, and tutoring. Striking differences in final achievement were measured. “It was typically found that the average student under tutoring was about two standard deviations above the average control class.” Further, “mastery learning was about one standard deviation above the control class” (Bloom, 1984, pp. 4–16).

“Whether it was a correspondence course, radio broadcast, video, television broadcast or closed-loop activity, CD Rom, or E-learning, the answer to this question for the most part has always been the same — no significant difference.”

From a very negative view teaching a positive solution, Edward L. Vockell (1994) published a paper entitled, “The Minus Two-Sigma Problem: Defective Instruction.” Reviewing the poor teaching methods of a ninth-grade English teacher, Vockell defined selected alterable variables that influence student achievement.

At the 2001 Interservice/Industry Training, Simulation, and Education Conference, Kristin Hasselbrack’s presentation suggested the achievement of a two sigma shift was most probable with asynchronous on-line learning where the program planning and implementation aided cognitive development and critical thinking (Hasselback, personal interview, December 3, 2001).

In “Innovations in On-line Learning: Moving Beyond No Significant Differ-

ence,” Carol A. Twigg (2001) cites differences between the old paradigm community investments of time and energy in old rules and the paradigm shifters she calls the “new providers.” Case after case is presented defining how “ground breaking” occurs as some colleges and universities become “pace setters” toward greater individualization of students.

Of particular note was a small Arizona college, Rio Salado at Tempe. In personal emails, Karen Mills provided aspects of Rio Salado’s approach.

The goal is to show that it’s not providing student service on-line; it’s how you provide student services on-line. The faculty service department (26 people) recruits, trains, and assigns 750 adjunct faculty to work with full time faculty. A student who needs an on-line

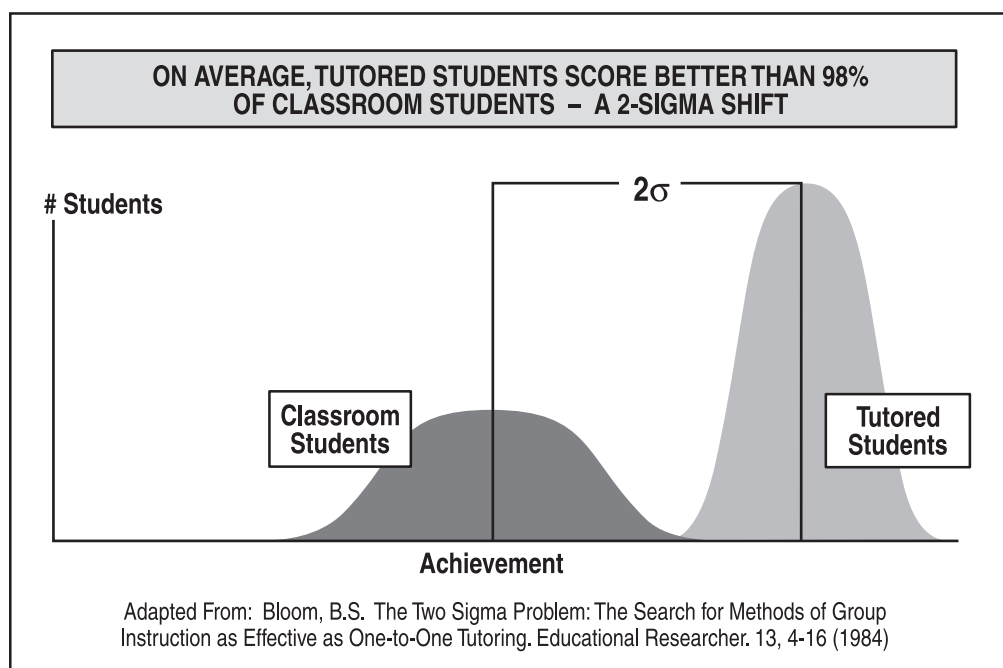


Figure 1.
Achievement Comparison of Classroom Students vs. Tutored Students

tutor informs the service department, the tutor is beeped and within two hours of the page, seven days a week, fourteen hours a day, the student has a tutor answering his/her need. Information services have voice mail boxes complete with 800 numbers for students and faculty. Under certain conditions it is possible for tech services to actually take control of the distant learner's computer key board to help solve problems" (Mills, personal communication, March 2002).

On-line learning is an infant industry that was born weighing in at 800 pounds. The axiom of new business ventures is, "Find a need and fill it." The world population needs education that is ethical, practical, and timely. On-line education can fill that need if program planning like that conducted at Rio Salado College is accomplished. Rio Salado recognized that the student is the customer not the sponsoring institution, educational course, or professor, by embracing the quality vigorously espoused by the late Dr. W. Edwards Deming (1986) in his book, "Out of the Crisis."

The university and college educational system in the United States and in the world is in a crisis. The Pew Grant Program in Course Redesign defines five key features that can improve the quality and ethics in student learning:

1. An initial assessment of each student's knowledge/skill level and preferred learning style.
2. An array of high-quality, interactive learning materials and activities.

3. Individualized study plans.
4. Built-in, continuous assessment to provide instantaneous feedback.
5. Appropriate, varied kinds of human interaction when needed.

CONCLUSION

The Pew Grant Program in Course Design (Program Planning) is fully endorsed and embraced. Rio Salado College is openly commended for breaking new ground in program planning, recognizing student's tutor needs and answering the beeper within two hours, seven days a week, and 14 hours a day with a staff of 750 adjunct faculty. If the standards of Socrates and Plato are to be obtained, they are only achievable when students are responsible for their own learning and the on-line educational system is structured to aid their quest.

The literature supports the consideration that adult students are willing and able to learn. The caveat is unless the motivational aspects outlined by Keller and Burkman are followed, the isolated student will feel abandoned and, suffering anaclitic depression, will most likely quit the course. The Program Planning team must also be motivated along the lines offered by Cornell and Martin. If the Program Planning team does not satisfactorily accomplish its effort in course redesign, asynchronous on-line students will gravitate to those colleges and universities who practice setting the paradigm back to zero.

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APPENDIX

COURSE DESIGN CONSIDERATIONS

Principles and Motivational Design Strategies

Variation and Curiosity

1. Make changes in organization and presentation of content to stimulate attention and curiosity.
2. Provoke mental conflict by introducing problems to be solved and contradictory facts.
3. Engage in Internet-based competitions between students in class as well as those located in other classes or at other institutions.
4. Develop diversity of Web-based products, which appeal to different learning styles.

Relevance

1. Build a strong relationship between what is being learned and the objectives of the course.
2. Show how the instruction relates to what the learner already knows.
3. Show how the instruction relates to the student [SIC] future goals.
4. Adapt course requirements to the learning style of students.
5. Be an enthusiastic instructor who is also in the process of learning new things.

Challenge Level

1. Include a student study guide with the following:
 - a. Advance organizer to show students where they are going and how to get there.
 - b. The goals and performance requirements.
 - c. Student selected goals and learner options for activities.
2. Provide opportunities for students to interact with the instructor, other students, and the instructional materials.
3. Provide short segments of instruction.
4. Provide frequent summaries and reviews.
5. Provide frequent conformational and corrective feedback.
6. Have students submit work early in the course.
7. Ask students to overtly state their intention to finish the course.

Positive Outcomes

1. Provide the opportunity for students to use the new skills and knowledge learned during the course.
2. Reward accomplishment by using positive feedback.
3. Use extrinsic rewards (games with points, privileges, or tokens) to sustain motivation.
4. Share work done on Web with others, especially those at other institutions.
5. Encourage collaboration between students as they develop Web-based assignments.

Positive Impression

1. Make the initial perception of print courseware seem easy, rather than difficult. For example, teach students how to use appropriate search strategies to navigate the Web.
2. Make the instructional text well organized.
3. Make the physical attributes of the product consistent with learner expectations through instruction related to good graphic and text design principles, i.e., use of white space, complementary colors and background, limited use of visuals, plain typeface and font, etc., in materials produced for the course.
4. Use graphics, pictures, maps, charts, etc., that make the information easier to understand and to hold the students' attention. The most effective pictures include people in color and include novelty and drama.
5. Organize a Web contest to be judged by a panel of technologists who have an interest in both the mechanics of Web design as well as the aesthetics.

Readable Style

1. Use active voice and action verbs.
2. Use sentences that are moderate length.
3. Vary the vocabulary.

Early Interest

1. Create interest in the instruction as early as possible.
2. Provide opportunities early in the instruction to interact with others and with the instructional materials (Khan, 1997, pp. 96–98).